

10/523888
DT01 Res PCT/PTC 04 FEB 2005AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application:

1. (Currently Amended) An expanded polystyrene particle with a functional skin layer ~~consisting of~~ comprising:

an inner expanded polystyrene layer; and

a functional skin layer,

wherein the inner expanded polystyrene layer is formed by heating and expanding an expandable polystyrene bead or pellet, and the functional skin layer is formed by coating the surface of the inner expanded polystyrene layer with a functional coating composition ~~containing~~ having 10~ to 99 wt% of a vinyl acetate based polymer and 0.1~ to 90 wt% of at least one functional additive.

2. (Currently Amended) The expanded polystyrene particle with functional skin layer according to claim 1, wherein the vinyl acetate based polymer ~~is~~ includes a vinylacetate homopolymer, or a copolymer of vinyl acetate and at least one monomer selected from a group of consisting of: vinyl esters, ~~such as vinyl caproate and vinyl stearate~~; acrylic esters, ~~such as ethyl acrylate, butyl acrylate and octyl acrylate~~; fumaric acid esters, ~~such as dibutyl maleate~~; carboxylic acids, ~~such as maleic acid, acrylic acids and itaconic acid~~; vinyl alcohols; butadienes; and caprolactones; ~~or~~ and a mixture or a blend thereof, and

wherein the vinyl acetate based polymer has a degree of polymerization (DP) of 10~ to 100,000.

3. (Currently Amended) The expanded polystyrene particle with functional skin layer according to claim 1, wherein the functional skin layer has a thickness corresponding to 0.003~ to 10% of the overall diameter of the particle, and ~~makes up~~ has 1~ to 95 wt% ~~based on~~ of the total weight of the particle.

4. (Currently Amended) The expanded polystyrene particle according to claim 1, wherein the functional additive is selected from the group consisting of expanding agents, nucleating agents, lubricants, antioxidants, heat stabilizers, ultraviolet stabilizers, biostabilizers, fillers, reinforcing agents, plasticizers, colorants, impact-resistant agents, flame retardants, antistatic agents, crosslinking agents, fluorescent whitening agents, thermal conductivity-imparting agents, electrical conductivity-imparting agents, permeability modifiers, magnetism-imparting agents, surfactants, stabilizers, excipients, drugs, solvents, hardeners, desiccants, fortifying agents, flavoring agents, antibacterial agents, and mixtures thereof.

5. (Currently Amended) A functional expanded polystyrene molded product manufactured by molding the expanded polystyrene particle with functional skin layer according to ~~any one of claims 1 to 4.~~

6. (Currently Amended) A process for producing expanded polystyrene particles with functional skin layer, ~~comprising the steps of:~~

heating and expanding expandable polystyrene beads or pellets to produce expanded polystyrene particles;

applying a functional coating composition to the surface of the ~~above~~-expanded polystyrene particles, the functional coating composition being prepared by mixing or dissolving at least one functional additive with a vinyl acetate based polymer solution to form a functional skin layer; and

adding a release agent to the expanded polystyrene particles whose surface is coated with the functional coating composition, to separate the expanded polystyrene particles having the functional skin layer into individual particles, and drying the separated particles.

7. (Original) The process according to claim 6, wherein the solvent used to prepare the vinyl acetate based polymer solution is water, or an organic solvent selected from alcohols, esters, ketones, carboxylic acids, aromatics, and halogenated hydrocarbons, or mixtures thereof.

8. (Currently Amended) The process according to claim 6, wherein the vinyl acetate based polymer solution ~~contains~~includes 3~ to 80 wt% of a vinyl acetate based polymer based on the total weight of the vinyl acetate based polymer solution.

9. (Currently Amended) The process according to claim 6, wherein the release agent is ~~selected from~~includes hydrophilic liquid materials ~~containing~~having two or more hydroxyl groups (-OH) in their molecular structure, ~~such as water, ethylene glycol and glycerin, and silicone oils, and~~or mixtures thereof.

10. (Currently Amended) A process for manufacturing a functional expanded polystyrene molded product, comprising ~~the steps of:~~

introducing the expanded polystyrene particles with functional skin layer produced by the process according to ~~any one of claims 6 to 9~~ into a steam molder; ~~and~~

applying high-pressure steam to the molder to bond the expanded polystyrene particles with functional skin layer to each other through their functional skin layer; ~~followed by and~~

cooling the bonded expanded polystyrene particles.

11. (New) The expanded polystyrene particle with functional skin layer according to claim 2, wherein the vinyl esters includes vinyl caproate or vinyl stearate, the acrylic esters includes ethyl acrylate, butyl acrylate or octyl acrylate, the fumaric acid esters includes dibutyl maleate, the carboxylic acids includes maleic acid, acrylic acids, or itaconic acid.

12. (New) The expanded polystyrene particle with functional skin layer according to claim 2, wherein the content of the vinyl acetate monomer in the vinyl acetate based polymer is 55% or more.

13. (New) The process according to claim 9, wherein the hydrophilic liquid materials includes water, ethylene glycol or glycerin.